

09/939,932

PHOT/02

## In the Claims

1. (Currently amended) A method for producing a halftone image, said method comprising determining an overlap of at least a portion of a first dot of a halftone cell of a halftone screen with at least a portion of a second dot of said halftone cell of said halftone screen; and overlapping said at least said portion of said first dot with said at least said portion of said second dot throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.
2. (Previously Presented) The method according to claim 1, further comprising differing line frequencies of said first and second dots.
3. (Original) The method according to claim 1, further comprising differing shapes of said first and second dots.
4. (Original) The method according to claim 3, further comprising selecting said shapes of said first and second dots from a group consisting of: elliptical, triangular, circular, rectangular, diamond and linear shapes.

09/939,932

PHOT/02

5. (Original) The method according to claim 1, further comprising differing tonal characteristics of said first and second dots.
6. (Canceled)
7. (Previously Presented) The method according to claim 1, further comprising orienting a first angle of said first dot differently than a second angle of said second dot relative to a first side of said halftone cell.
8. (Currently amended) A method for producing a halftone image, said method comprising placing a first dot of a halftone screen and a second dot of said halftone screen within a halftone cell, wherein said first and second halftone dots are dissimilar and wherein said dots are generated at a threshold value throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.
9. (Previously Presented) The method according to claim 8, further comprising differing line frequencies of said first and second dots.
10. (Original) The method according to claim 8, further comprising differing shapes of said first and second dots.

09/939,932

PHOT/02

11. (Previously Presented) The method according to claim 10, further comprising selecting said shapes of said first and second dots from a group consisting of: elliptical, cross, triangular, circular, rectangular, diamond and linear shapes.

12. (Original) The method according to claim 8, further comprising differing tonal characteristics of said first and second dots.

13. (Original) The method according to claim 8, further comprising orienting an angle of said first dot differently than a second angle of said second dot relative to a first side of said halftone cell.

14. (Currently amended) A printing plate comprising a printing and a non-printing surface, wherein said printing surface is manufactured using a halftone screen having a first and a second dot within a halftone cell of said halftone screen, wherein at least a portion of said first dot is programmatically determined to overlap at least a portion of said second dot throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.

15. (Previously Presented) The printing plate according to claim 14, wherein each of said first and second dots have different shapes.

09/939,932

PHOT/02

16. (Previously Presented) The printing plate according to claim 15, wherein said different shapes are selected from a group consisting of: elliptical, triangular, rectangular, circular, cross, diamond and linear shapes.

17. (Previously Presented) The printing plate according to claim 14, wherein each of said first and second dots have different tonal characteristics.

18. (Previously Presented) The printing plate according to claim 14, wherein each of said first and second dots have different line frequencies.

19. (Previously Presented) The printing plate according to claim 14, wherein said first dot is oriented at a different angle than said second dot relative to a first side of said halftone cell.

20. (Currently amended) A printing plate comprising a printing and a non-printing surface, wherein said printing surface is manufactured using a halftone screen having a first and a second dot within said halftone cell of a halftone screen, wherein said first and second dots are dissimilar and are generated at the same threshold value throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.

09/939.932

PHOT/02

21. (Previously Presented) The printing plate according to claim 20, wherein each of said first and second dots has a different line frequency.

22. (Previously Presented) The printing plate according to claim 20, wherein each of said first and second dots has a different shape.

23. (Previously Presented) The printing plate according to claim 22, wherein said different shape is selected from a group consisting of: elliptical, triangular, rectangular, circular, diamond and linear shapes.

24. (Previously Presented) The printing plate according to claim 20, wherein each of said first and second dots has a different tonal characteristic.

25. (Previously Presented) The printing plate according to claim 20, wherein said first dot is oriented at a different angle than said second dot relative to a first side of said halftone cell.

26. (Currently amended) A processor configured to generate a halftone screen comprising a halftone cell derived from a threshold equation, wherein a fold function of said threshold equation generates at least one dot within said halftone cell according to  $\text{fold}(x) = \frac{1}{3}x^3 - \frac{1}{3}x$  throughout said image in a manner that in substantially all halftone cells the

09/939.932

PHOT/02

narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell; and

a computer readable medium bearing said halftone screen.

09/939,932

PHOT/02

27. (Currently amended) A program product, comprising:

a processor configured to place a first and a second dot within a halftone cell of a halftone screen, to determine an overlap between at least a portion of said first dot and at least a portion of said second dot, to overlap said at least said portions throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell; and

a computer readable medium bearing said program.

28. - 29. (Canceled)

30. (Currently amended) A program product, comprising:

a processor configured to place a first generated at a threshold value and a second dot generated at said threshold value within a halftone cell of a halftone screen, wherein said first and second dots are dissimilar in at least one characteristic selected from a group consisting of: shape, frequency, tone and orientation throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell; and

a computer readable medium bearing said program.

31. -32. (Canceled)

09/939,932

PHOT/02

33. (Currently amended) A method for producing a halftone image using a program that executes on a processor, comprising creating a printing plate manufactured using a halftone screen including halftone dots generated at a threshold value having different line frequencies throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.

34. (Previously Presented) The method of claim 33, wherein creating said printing plate further comprises integrating fine and coarse frequency dots.

35. (Previously Presented) The method of claim 33, wherein creating said printing plate further comprises overlapping at least a portion of a first dot of a halftone cell of said printing plate with at least a portion of a second dot of said halftone cell.

36. (Previously Presented) The method of claim 33, wherein creating said printing plate further comprises placing a first and a second dot within a halftone cell of said printing plate, wherein said first and second halftone dots are dissimilar.

37. (Previously Presented) The method of claim 33, wherein creating said printing plate further comprises creating at least one of a halftone screen and threshold array, both said array and said screen including dots having different frequencies.



09/939,932

PHOT/02

38. (Canceled)

39. (Previously Presented) The printing plate of claim 67, wherein said dots include a frequency selected from a group consisting of at least one of: a coarse pitch, a fine pitch and an integrated pitch.

40. (Previously Presented) The printing plate of claim 67, wherein said halftone screen includes at least a portion of a first dot overlapped with at least a portion of a second dot.

41. (Previously Presented) The printing plate of claim 67, wherein said halftone screen includes first and second dots, wherein said first and second dots are dissimilar.

42. (Previously Presented) The method of claim 1, wherein said overlapping further comprises creating said halftone image to include dots having different line frequencies.

43. (Previously Presented) The method of claim 8, wherein said placing of said first and second dots further comprises creating an array that includes dots having different line frequencies.

44. (Previously Presented) The printing plate of claim 67, wherein said halftone screen further comprises dots having different line frequencies.

09/939,932

PHOT/02

45. (Currently amended) A printing system, including:

a scanning circuit for reading image data from a source;

a processor in communication with said scanning circuit, wherein said processor receives and processes the image data to generate an image file;

an image setter in communication with said processor, wherein said image setter receives said image file from said processor and produces a plurality of dots on a halftone screen, said plurality of dots including a plurality of line frequencies at a threshold value throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.

46. (Currently amended) A printing system, including:

a scanning circuit for reading image data from a source;

a processor in communication with said scanning circuit, wherein said processor receives and processes the image data to generate an image file;

an image setter in communication with said processor, wherein said image setter receives said image file from said processor and produces a plurality of dots on a halftone screen, said plurality of dots including a first and a second dot within a halftone cell of said halftone screen, wherein said image setter determines that at least a portion of said first dot overlaps at least a portion of said second dot throughout said image in a manner that in substantially all halftone

09/939,932

PHOT/02

cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.

47. (Currently amended) A printing system, including:

a scanning circuit for reading image data from a source;

a processor in communication with said scanning circuit, wherein said processor receives and processes the image data to generate an image file;

an image setter in communication with said processor, wherein said image setter receives said image file from said processor and produces a plurality of dots on a halftone screen, said plurality of dots including a first and a second dot within a halftone cell of said halftone screen, wherein said first and second dots are dissimilar and generated at a threshold value throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.

48. (Currently amended) A program product, comprising:

a computer executable program configured to produce a plurality of dots on a halftone screen, wherein said plurality of dots include multiple line frequencies at a threshold value throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell; and

09/939.932

PHOT/02

a computer readable medium bearing said computer executable program.

49. (Canceled)

50. (Previously Presented) The method of claim 34, wherein said integrating said fine and coarse frequency dots further includes generating a mid-tone dot.

51. (Previously Presented) The method of claim 33, further comprising transitioning between said dots of different frequencies using a dot that includes a third pitch.

52. (Previously Presented) The method of claim 33, wherein creating said printing plate includes generating at least one of said dots to include a frequency selected from a group consisting of at least one of: a fine pitch, a coarse pitch and an integrated pitch.

53. (Previously Presented) The method of claim 33, wherein said creating said printing plate further includes generating a cross shape.

54. (Previously Presented) The method of claim 33, wherein creating said printing plate further includes creating a smooth transition between said dots.

09/939,932

PHOT/02

55. (Previously Presented) The apparatus of claim 67, wherein said halftone screen further includes a gradual transition between said dots having different line frequencies.

56. (Previously Presented) The apparatus of claim 67, wherein said halftone screen further includes a dot having a third line frequency, wherein said dot having said third line frequency is positioned between said dots having different line frequencies.

57. (Previously Presented) The apparatus of claim 67, wherein said halftone screen further includes a mid-tone dot positioned between said dots having different line frequencies.

58. (Cancelled)

59. (Previously Presented) The apparatus of claim 67, wherein said halftone screen includes a substantially cross shape.

60. (Currently amended) A method for producing a halftone image using a program that executes on a processor, comprising creating a threshold array including a gradual transition between highlights and shadows of said threshold array, and wherein said gradual transition includes multiple halftone dots at a threshold value having multiple line frequencies throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-

09/939.932

PHOT/02

bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.

61. (Previously Presented) The program product of claim 48, wherein said program is further configured to gradually transition between said multiple line frequencies.
62. (Previously Presented) The method of claim 60, further comprising programmatically determining to overlap dots of said threshold array.
63. (Previously Presented) The method of claim 60, further comprising including within said threshold array a plurality of dots at a threshold value that include at least one dissimilar characteristic selected from a group consisting of: line frequency, shape, tone and orientation.
64. (Previously Presented) The method of claim 60, further comprising using said threshold array to generate a halftone image.
65. (Previously Presented) The method of claim 1, wherein producing said halftone image further includes producing at least one of a printing plate, a threshold array and a halftone screen.
66. (Previously Presented) The method of claim 1, wherein said overlapping further includes generating a cross shape.

09/939,932

PHOT/02

67. (Currently amended) A printing plate comprising a printing and a non-printing surface, wherein said printing surface is manufactured using a common halftone screen that includes halftone dots generated at a threshold value, wherein said halftone dots include different line frequencies throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell.

68. (Currently amended) A processor for executing a program configured to generate a threshold array that includes a highlight and a shadow region, wherein said threshold array further includes a gradual transition between said highlight and shadow regions, and wherein said gradual transition comprises multiple halftone dots at a threshold value having multiple line frequencies throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell; and

a computer readable medium bearing said threshold array.

69. (Previously Presented) The apparatus of claim 68, wherein said threshold array further includes overlapped dots.

09/939,932

PHOT/02

70. (Previously Presented) The apparatus of claim 68, wherein said threshold array further includes a plurality of dots that include at least one dissimilar characteristic selected from a group that consists of: frequency, shape, tone and orientation.

71. (Previously Presented) The printing system of claim 45, further comprising including a smooth transition between said plurality of dots.

72. (Previously Presented) The printing system of claim 45, wherein said recording medium is selected from a group consisting of: a threshold array, a halftone screen and a printing plate.

73. (Previously Presented) The apparatus of claim 14, further comprising at least one of a threshold array and a halftone screen, wherein both said array and said screen are associated with said printing plate.

74. (Previously Presented) The apparatus of claim 20, further comprising at least one of a threshold array and a halftone screen, wherein both said array and said screen are associated with said printing plate.

75. (Currently amended) A program product, comprising:

a program configured to produce a threshold array that includes a highlight and a shadow region, wherein the threshold array further includes a smooth transition between said highlight



09/939,932

PHOT/02

and said shadow region, and wherein said smooth transition comprises multiple halftone dots at a threshold value having multiple line frequencies throughout said image in a manner that in substantially all halftone cells the narrowest width of any ink-bearing portion of each halftone cell is no greater than approximately 30% of the width of the halftone cell; and

a computer readable medium bearing said program.

76. (Canceled)